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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,896	05/16/2006	Renato Bugge	BRW-002USRCE	1816

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EXAMINER	
LANGMAN, JONATHAN C	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
11/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,896	BUGGE ET AL.	
	Examiner	Art Unit	
	JONATHAN C. LANGMAN	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *1-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 17, 2009 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 26-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 26 and 29-31 depends from independent claim 24, which teaches a system. The system comprises a kit, wherein the kit comprises two materials a semiconductor material and an etchant for etching. In claims 26 and 29-31 the applicant states that the etched material is part of some device. However it is unclear where the claims provide antecedent basis that positively recites etching of the

semiconductor. Therefore claim 26 lacks proper antecedent basis in that claims 24 and 25 never recite a specific step of etching the semiconductor.

Claims 27 and 28 are rejected for being dependent upon a base rejected claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24 and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishurnyi et al. (Multicomponent Sb-Based solid solutions grown from Sb-Rich liquid phases") in view of Boos et al., (US 5,798,540).

Mishurnyi et al. teach an AlGaInAsSb quinternary layer (abstract) and a formula of $Al_xGa_{1-x-z}In_zAs_ySb_{1-y}$ (page 38 second paragraph). Mishurnyi teaches using the layer in lasers. Mishurnyi does not teach etching the substrate.

Boos et al. teach an electronic semiconductor device comprising a HEMT, comprising layers of InAlAsSb, AlGaAsSb, etc. (col. 3, lines 20 and 45-50) layers. HEMT's are known in the art to form optical sensors. To form these structures Boos teaches etching the layers with a wet etching solution comprising, lactic or acetic acid, hydrogen peroxide, and hydrofluoric acid (col. 4, lines 54-66). Lactic or acetic acid is an organic acid, and hydrogen peroxide is an oxidizing agent. It would have been obvious to a person having ordinary skill in the art at the time the present invention was made to

use this etchant technique taught by Boos in order to etch the hetero structures of Mishurnyi in order to form a desired structure. Although Boos may not specifically teach that the etchant is used on AlGaInAsSb structures, a routineer in the art would have appreciated the work since Boos teaches etching AlInAsSb, and would have applied this known etching composition to Mishurnyi in order to obtain a desired structure. Boos has shown that these etching techniques for compound semiconductors of the AlGaIn series are beneficial and a known technique in the art.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mishurnyi and Boos, as applied to claims 24 and 26-31 above, further in view of Garbuzov et al. ("2.3-2.7 micron Room temperature CW operation of InGaAsSb-AlGaAsSb Broad Waveguide SCH-QW Diode Lasers").

Boos teach an etchant for semiconductor materials. Mishurnyi teach an AlGaInAsSb layer as described above. Mishurnyi do not specifically teach doping the layer. However it is known in the art and taught by Garbuzov et al., that to achieve desired electrical properties doping GaAlIn series layers with Te in order to achieve n-type layers, and to use Be to achieve p-type layers. It would have been obvious to a person having ordinary skill in the art at the time the present invention was made to dope the layers as taught by Mishurnyi with known dopants such as Te for n-type doping and Be for p-type doping, in order to obtain desired electrical properties as is known in the art.

Claims 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishurnyi and Boos or Mishurnyi, Boos and Grabuzov; in further view of Deryagin et al., "High Quality AlGaAsSb, AlGaAsSb and InGaAsSb epitaxial layers Grown by LPVE from Sb-rich melts".

Mishurnyi et al. do not disclose the type of lasers these layers may be used in. Deryagin et al. teach that AlGaAsSb layers may be used in lasers, photodiodes, and Led's, (introduction). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the present invention was made to use the semiconductor device and etching steps of Boos et al., to form and use the structure as an LED, Photodiode, sensor and Laser, as is known in the art.

Regarding claims 29-30, the semiconducting structure, is more than capable of being used as a part of a VCSEL or a PCDFL as is known in the art.

Response to Arguments

The applicant's arguments in regards to the 112 1st paragraph have been considered and the rejection has been withdrawn.

The applicant amended the claims to state that now include a system which comprises two parts a semiconductor and an etchant. Therefore the 102 rejection has been overcome in that Mishurnyi does not teach the instantly claimed etchant.

The 103 rejections in view of Mishurnyi and Boos however are maintained for the following reasons. The applicant argues that Boos et al. teach that the etchant attacks InAs, InAlAsSb, AlSb and GaSb, but does not attack GaAs. The applicants submit that

the instantly claimed AlGaInAsSb material is different than AlInAsSb described in Boos et al. and that Boos et al. described that the etchant does not attack GaAS and Au based Alloys."

It appears that the applicant is misinterpreting Boos et al. Boos et al. teaches that the etchant does not attack gold based alloys or GaAs. There is no mention of "GaAs alloys" not being attacked. In fact Boos et al. teaches that AlGaAsSb (an "alloy" of GaAs according to the applicant) is suitable to be used in the devices of Boos and to be etched by Boos (col. 3, lines 46).

The applicant has not persuasively shown that a routineer in the art would have used these etchants with similar semiconductor materials taught by Mishurnyi including those materials instantly claimed.

Applicants respectfully submit that there is no prior art showing that the etchant described in Boos et al. is applied to the AlGaInAsSb, and the applicants request that the Examiner provide documentary evidence supporting the Examiner's position. If the examiner did have evidence then the claims would be rejected under 102 not 103. The basis for obviousness does not require anticipation, and therefore the rejections are maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN C. LANGMAN whose telephone number is

(571)272-4811. The examiner can normally be reached on Mon-Thurs 8:00 am - 6:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCL

/Timothy M. Speer/
Primary Examiner
Art Unit 1794